REMARKS

By this Supplemental Amendment, Applicant has amended claims 1, 12, 24, and 40. Claims 1–29 and 31–40 are pending, with claim 30 having previously been canceled.

Claim Rejection Under 35 U.S.C. § 103

In the Final Office Action, the Examiner rejected claims 1–3, 5–14, 16–26, 28–29 and 31–38 under 35 U.S.C. 103(a) as being unpatentable over Sanderson et al. (US 2004/0223500) in view of Luo (US 2005/0044262). In addition, the Examiner rejected claims 4, 15 and 27 under 35 U.S.C. 103(a) as being unpatentable over Sanderson et al. and Luo as applied to claim 1, and in further view of Bragg (US 7,286,479). Applicant respectfully traverses the rejection to the extent such rejections may be considered applicable to the claims as amended. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested a rational reason to lead a person of ordinary skill in the art to arrive at the claimed invention.

In the Final Office Action, the Examiner asserted that Sanderson discloses several features of claim 1, but acknowledged that Sanderson lacks any teaching of communicating L2 service information using a routing protocol by outputting a routing communication that includes the L2 service information. Nonetheless, the Examiner cited Luo as disclosing communicating L2 service information using a routing protocol, citing paragraphs [0041]–[0042] of Luo. Specifically, the Examiner cited Luo as disclosing using the Border Gateway Protocol for auto-discovery of remote forwarders, where "a forwarder identifier is part of the L2 service information."[1] Luo describes using a common addressing scheme for pseudowire signaling protocols to establish connectivity among forwarders of different applications.[2] Paragraph [0042] of Luo describes that autodiscovery of remote forwarders and establishment of control connections between provider edge routers may be performed using BGP. The control connections/channels established based on the autodiscovery are used for subsequent pseudowire signaling.[3] Luo in no manner discloses or suggests that the BGP autodiscovery or the control connections established based on the autodiscovery could be used for communicating L2 service information across a plurality of intermediate networks. In fact, as illustrated by FIG. 1 of Luo,

[1] Final Office Action dated April 10, 2009.
[2] Luo, Abstract.
[3] Luo, at paragraphs [0042], [0045].

Luo is directed to techniques for making connections within a single provider network, and does not even suffer from the problem addressed by Applicant's invention as to how to communicate L2 service information, including MAC address state information, across a plurality of intermediate networks.

Applicant has amended the claims to further clarify the features of the claimed invention. Claim 1, as amended, recites establishing a peering session between a first device associated with a first customer network and a second device associated with a second customer network using a first routing protocol. Claim 1 also requires establishing a label switched path (LSP) through a plurality of intermediate networks communicatively coupled between the first customer network and the second customer network, and after establishing a peering session and the LSP, communicating layer two (L2) service information over the peering session using the first routing protocol between the first device associated with the first customer network and the second device associated with the second customer network. Communicating the L2 service information using the first routing protocol comprises the first device outputting a routing communication in accordance with the first routing protocol, wherein the routing communication includes the L2 service information, and wherein the L2 service information comprises Media Access Control (MAC) address state information for devices in the first customer network. Claim 1 also requires providing an L2 service in accordance with the L2 service information to transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP, wherein at least one of the plurality of intermediate networks does not support the L2 service. Support for amended claim 1 can be found throughout the original specification, including at paragraphs [0005], [0008], [0026], and [0043].

Thus, as amended, claim 1 requires not only using a routing protocol to initially establish a peering session, but additionally separately requires communicating, over the peering session established using the routing protocol, L2 service information that includes MAC address state information for devices in the first customer network. That is, claim 1 requires using the routing protocol for establishing a peering session, as well as using the routing protocol for subsequently communicating learned MAC addresses between first and second customer networks separated by a plurality of intermediate networks after the peering session has been established, as part of the L2 service's flooding and learning procedures. In this manner, the method of claim 1 can be

used to provide an L2 service to transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP, even where at least one of the plurality of intermediate networks does not support the L2 service. Neither Sanderson nor Luo, alone or in combination, discloses or suggests these features of amended claim 1.

As explained above, Luo describes autodiscovery of remote forwarder identifiers using BGP. With regard to Sanderson, Sanderson describes a PE router that has an EBGP or IBGP peering relationship with another PE router for aggregating and forwarding customer VPN routing information across a backbone network.[4] This provides no teaching or suggestion as to how to transport L2 communications between first and second customer networks through a plurality of intermediate networks.

Thus, the combination of Sanderson in view of Luo at best teaches autodiscovery of remote forwarder identifiers using BGP, then forwarding customer VPN routing information across a backbone network using BGP. Sanderson in view of Luo in no manner discloses or suggests that the BGP autodiscovery or control connections established based on the autodiscovery could be used for communicating L2 service information. In particular, Sanderson in view of Luo provides no suggestion of subsequently exchanging MAC address state information for devices in the remote customer networks by outputting a routing communication using the peering session that is established across a plurality of intermediate networks.

New dependent claim 39 also illustrates the differences between Applicant's invention and the cited references. Claim 39 requires continuously outputting routing communications that include L2 service information comprising MAC address state information for devices in the first customer network as the MAC address state information is learned by the first device. In this manner, the techniques allow devices associated with remote customer networks to emulate L2 connectivity across a plurality of intermediate networks, even where the L2 service, e.g., VPLS, is not supported by one or more of the intermediate networks. Support for new claim 39 can be found throughout the original specification, including at paragraphs [0023] and [0051]. The cited references fail to disclose or suggest such features.

Claim 12

[4] Sanderson, at paragraphs [0135]; [0171].

Claim 12 recites a device comprising one or more interface cards configured to communicate packets via input links and output links, and a routing process that receives label information for a LSP through a plurality of intermediate networks communicatively coupled between a first customer network and a second customer network, wherein the routing process receives the label information from packets received by the one or more interface cards. Claim 12 further recites a first routing protocol that establishes a peering session between the device and a second device associated with the second customer network, and receives L2 service information associated with the second customer network by receiving a routing communication over the peering session that includes the L2 service information, wherein the L2 service information comprises MAC address state information for devices in the first customer network. Claim 12 also recites an L2 service that operates in accordance with the L2 service information and transports L2 communications between the first customer network and the second customer network through the plurality of intermediate networks in accordance with the label information by outputting the L2 communications via the output links of the one or more interface cards.

For reasons similar to those set forth above, Sanderson in view of Luo fails to disclose or suggest these features. For example, Sanderson in view of Luo fails to disclose or suggest a first routing protocol that establishes a peering session between the device and the second device, and receives L2 service information associated with the second customer network by receiving a routing communication over the peering session that includes the L2 service information, wherein the L2 service information comprises MAC address state information for devices in the first customer network.

Claim 24

Claim 24 recites a system comprising a border router that establishes a LSP through a plurality of intermediate networks, wherein the LSP communicatively couples a first customer network and a second customer network, and a first route reflector associated with the first customer network that establishes a peering session between the first route reflector and a second route reflector associated with a second customer network using an exterior routing protocol, and communicates L2 service information with the second route reflector associated with the second customer network via routing communications that conform to the exterior routing protocol, wherein the routing communications include the L2 service information, and wherein the L2

service information comprises MAC address state information for devices in the first customer network. Claim 24 further recites an edge router that provides an L2 service to the first customer network in accordance with the L2 service information to transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks using the LSP.

For reasons similar to those set forth above, Sanderson in view of Luo fails to disclose or suggest these features. For example, Sanderson in view of Luo fails to disclose or suggest a first route reflector associated with the first customer network that establishes a peering session between the first route reflector and a second route reflector associated with a second customer network using an exterior routing protocol, and communicates L2 service information with the second route reflector associated with the second customer network via routing communications that conform to the exterior routing protocol, wherein the routing communications include the L2 service information, and wherein the L2 service information comprises MAC address state information for devices in the first customer network.

Claim 34

Claim 34 recites a computer-readable medium comprising instructions to cause a processor to execute a routing process that receives label information for a LSP through a plurality of intermediate networks communicatively coupled between a first customer network and a second customer network, wherein the L2 service information is received using the routing process by receiving a routing communication that conforms to a first routing protocol and that includes the L2 service information. Claim 34 further requires instructions to cause the processor to execute a L2 service that receives L2 service information associated with the second customer network using a first routing protocol, wherein at least one of the plurality of intermediate networks does not support the L2 service, and wherein the L2 service information comprises MAC address state information for devices in the second customer network, and transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks that do not support the L2 service in accordance with the MAC address state information using the LSP to emulate L2 connectivity across the intermediate networks.

For reasons similar to those set forth above, Sanderson in view of Luo fails to disclose or suggest these features. For example, Sanderson in view of Luo fails to disclose or suggest executing a L2 service that receives L2 service information associated with the second customer network using a first routing protocol, wherein at least one of the plurality of intermediate networks does not support the L2 service, and wherein the L2 service information comprises MAC address state information for devices in the second customer network, and transport L2 communications between the first customer network and the second customer network through the plurality of intermediate networks that do not support the L2 service in accordance with the MAC address state information using the LSP to emulate L2 connectivity across the intermediate networks.

For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1–29 and 31–39 under 35 U.S.C. 103(a). Withdrawal of this rejection is requested.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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